INDIVIDUAL PROPERTY/DISTRICT
MARYLAND HISTORICAL TRUST
INTERNAL NR-ELIGIBILITY REVIEW FORM

Property/District Name: Building E5380 Survey Number: HA - 1994

Project: Demolition of Bldg E5380 @ Aberdeen Proving Gd Agency: ARMY

Site visit by MHT Staff: _X_ no ___ yes Name _____ Date _____

Eligibility recommended __X__ Eligibility **not** recommended _____

Criteria: _X_A ___B _X_C ___D Considerations: ___A ___B ___C ___D ___E ___F ___G ___None

Justification for decision: (Use continuation sheet if necessary and attach map)

Building E5380, located in the Edgewood Area of Aberdeen Proving Ground is considered eligible for listing on the National Register of Historic Places under Criteria A and C. The CN Cyanide Manufacturing Plant was erected in 1942 as a chemical weapons manufacturing facility. The building was erected during the period of significance of Aberdeen Proving Ground and was directly associated with the primary mission of APG, that is the manufacturing of chemical weapons. The building qualifies for listing under Criterion A as representation of the chemical weapons manufacturing process prior to American military invovlement in, but during World War II.

The building is a two-story steel frame structure with metal sheathing. The building is covered with a gable roof and features banks of steel frame sash on at least two of its four elevations. Two metal staircases provide exterior access to the second story of the manufacturing facility. The building is representative of a chemical weapons manufacturing facility, and though somewhat altered, retains sufficient integrity to qualify for listing under Criterion C.

Documentation on the property/district is presented in: Project Review and Compliance

Prepared by: Mr. David Blick, Environmental Conservation and Restoration Division, Aberdeen Proving Ground, Aberdeen, Maryland

Kim Prothro Williams October 15, 1996
Reviewer, Office of Preservation Services Date

NR program concurrence: X yes ___ no ___ not applicable

Peter E Kurtze 10/16/96
Reviewer, NR program Date

Survey No. HA-1994

MARYLAND COMPREHENSIVE HISTORIC PRESERVATION PLAN DATA - HISTORIC CONTEXT

I. Geographic Region:

____	Eastern Shore	(all Eastern Shore counties, and Cecil)
____	Western Shore	(Anne Arundel, Calvert, Charles, Prince George's and St. Mary's)
__X__	Piedmont	(Baltimore City, Baltimore, Carroll, Frederick, Harford, Howard, Montgomery)
____	Western Maryland	(Allegany, Garrett and Washington)

II. Chronological/Developmental Periods:

____	Paleo-Indian	10000-7500 B.C.
____	Early Archaic	7500-6000 B.C.
____	Middle Archaic	6000-4000 B.C.
____	Late Archaic	4000-2000 B.C.
____	Early Woodland	2000-500 B.C.
____	Middle Woodland	500 B.C. - A.D. 900
____	Late Woodland/Archaic	A.D. 900-1600
____	Contact and Settlement	A.D. 1570-1750
____	Rural Agrarian Intensification	A.D. 1680-1815
____	Agricultural-Industrial Transition	A.D. 1815-1870
__X__	Industrial/Urban Dominance	A.D. 1870-1930
____	Modern Period	A.D. 1930-Present
____	Unknown Period (___ prehistoric	___ historic)

III. Prehistoric Period Themes:

____	Subsistence
____	Settlement
____	Political
____	Demographic
____	Religion
____	Technology
____	Environmental Adaptation

IV. Historic Period Themes:

____	Agriculture
__X__	Architecture, Landscape Architecture, and Community Planning
____	Economic (Commercial and Industrial)
____	Government/Law
__X__	Military
____	Religion
____	Social/Educational/Cultural
____	Transportation

V. Resource Type:

Category: Building

Historic Environment: Army Installation

Historic Function(s) and Use(s): Warehouse/Manufacturing Facility

Known Design Source: Chemical Warfare Service

Building E5380
MIHP# HA-1994
Aberdeen Proving Ground
1941
Public

Building E5380 (formerly Building 58) was designed and constructed in 1941 to function primarily as a lachrymator manufacturing facility; the facility produced various lachrymators or tear gas solutions including Chloroacetophenone (CN), Chloroacetophenone in Benzene and Carbon Tetrachloride (CNB), Chloroacetophenone and Chloropicrin in Chloroform (CNS), and Orthochlorobenzylidenemalononitrile (CS). Originally labeled CN Plant #2, production of CN began in December 1941 under less than optimal conditions as a result of the national emergency associated with the start of World War II. 'Part of World War II expansions, this facility represented a military investment in chemical preparedness and a continued response of the United States to the use of chemical weapons. Building E5380 was built on the World War I industrial site to update and expand chemical production and shell loading operations.' CN was the standard tear agent used by the United States Army prior to the introduction of CS in 1959; in 1960, CS was officially adopted by the United States Army for use in riot control. The production of lachrymators at Building E5380 was finally halted in 1964.

Based on this information, Building E5380 is eligible for listing on the National Register of Historic Places under Criterion A because of its direct association with chemical production during World War II and a portion of the Vietnam Conflict. This facility was directly involved with the primary mission of the United States Army Chemical Warfare Laboratories and its command group, the Army Chemical Center, presently the Research, Development and Engineering Command. It is also eligible for listing under Criterion C for its illustration as an industrial production facility.

Maryland Historical Trust Maryland Inventory of Historic Properties Form

Inventory No. HA-1994

1. Name of Property (indicate preferred name)

historic	Building 58, CN Manufacturing Plant #2
other	Building E5380 (preferred)

2. Location

street and number	Williams Road	X not for publication
city, town	Aberdeen Proving Ground, Edgewood Area	N/A vicinity
county	Harford	

3. Owner of Property (give names and mailing addresses of all owners)

name	Directorate of Installation Operations				
street and number	2201 Aberdeen Boulevard			telephone	410-306-1195
city, town	Aberdeen Proving Ground	state	Maryland	zip code	21005

4. Location of Legal Description

courthouse, registry of deeds, etc.	Harford County Courthouse, Land Records			tax map and parcel	N/A
city, town	Bel Air			liber N/A	folio N/A

5. Primary Location of Additional Data

_____ Contributing Resource in National Register District
_____ *Contributing Resource in Local Historic District*
__X__ Determined Eligible for the National Register/Maryland Register
_____ Determined Ineligible for the National Register/Maryland Register
__X__ Recorded by HABS/HAER
_____ Historic Structure Report or Research Report at MHT
_____ Other:_____

6. Classification

Category
_____district
__X__building(s)
_____structure
_____site
_____*object*

Ownership
__X__public
_____private
_____both

Current Function
_____agriculture
_____commerce/trade
_____defense
_____domestic
_____*education*
_____funerary
_____government
_____health care
_____industry
_____landscape
_____recreation/culture
_____religion
_____social
_____*transportation*
_____work in progress
_____unknown
__X__vacant/not in use
_____other:

Resource Count

Contributing	Noncontributing	
1	_____	buildings
_____	_____	sites
_____	_____	structures
_____	_____	*objects*
1	N/A	Total

Number of Contributing Resources previously listed in the Inventory
N/A

7. Description

Inventory No. HA-1994

Condition

___ excellent	X deteriorated
___ good	___ ruins
___ fair	___ altered

Prepare both a one paragraph summary and a comprehensive description of the resource and its various elements as it exists today.

Building E5380 is an industrial building that lacks ornamentation. It is rectangular in shape, 61'11" x 62'2" and includes an addition, 20' x 62'2", and an offset, 20' x 31'7". The building is two stories; the addition and the offset are integrated as one story side wings. It rests on a concrete slab foundation and employs a steel frame structure that is clad with corrugated transite. The entire building includes two different roofing styles: the main building has a gable roof with a relatively low pitch; the offset and the addition both have dropped shed-style roofs. However, all of the various roof types are covered with corrugated transite. All of the windows are industrial steel, multiple-paned, divided light windows. Most of the windows in the building share the same configuration and incorporate a pivoting sash; however, three banks of windows on the second floor of the main building have a different configuration and incorporate casement sashes. Pairs of metal doors are located on each side of the building with the exception of the east gable end. At the east gable end, two cylindrical metal tanks are connected to the building with large pipes. Metal staircases rise from the ground level to the second story level on the north, east and west façades; only the north façade staircase integrates a catwalk that extends over the offset. All of these staircases utilize single metal door openings on the second story level.

It is presumable that a high level of contamination exists in Building E5380 and the area surrounding the building as a result of the manufacturing operations of lachrymators such as, CN, CS, CNB, and CNS. As a result of the suspicion concerning chemical contamination, Building E5380 was abandoned in 1988 and has since been identified as excess to mission requirements. Consequently, the building itself is deteriorating and is creating yet another safety hazard.

8. Significance

Inventory No. HA-1994

Period	Areas of Significance	Check and justify below		
__ 1600-1699	__ agriculture	__ economics	__ health/medicine	__ performing arts
__ 1700-1799	__ archeology	__ education	X industry	__ philosophy
1800-1899	__ architecture	__ engineering	__ invention	__ politics/government
X 1900-1999	__ art	__ entertainment/ recreation	__ landscape architecture	__ religion
__ 2000-	__ commerce		__ law	__ science
	__ communications	__ ethnic heritage	__ literature	__ social history
	__ community planning	__ exploration/ settlement	__ maritime history	__ transportation
	__ conservation		X military	__ other: ____

Specific dates 1941 to 1964

Architect/Builder Whitman Requardt & Smith, engineers; Quartermaster Corps, architects

Construction dates 1941

Evaluation for:

_____ National Register _____Maryland Register ____X___not evaluated

Prepare a one-paragraph summary statement of significance addressing applicable criteria, followed by a narrative discussion of the history of the resource and its context. (For compliance projects, complete evaluation on a DOE Form – see manual.)

Building E5380 (formerly Building 58) was designed and constructed in 1941 to function primarily as a lachrymator manufacturing facility; the facility produced various lachrymators or tear gas solutions including Chloroacetophenone (CN), Chloroacetophenone in Benzene and Carbon Tetrachloride (CNB), Chloroacetophenone and Chloropicrin in Chloroform (CNS), and Orthochlorobenzylidenemalononitrile (CS). Originally labeled CN Plant #2, production of CN began in December 1941 under less than optimal conditions as a result of the national emergency associated with the start of World War II.[1] 'Part of World War II expansions, this facility represented a military investment in chemical preparedness and a continued response of the United States to the use of chemical weapons. Building E5380 was built on the World War I industrial site to update and expand chemical production and shell loading operations.'[2] CN was the standard tear agent used by the United States Army prior to the introduction of CS in 1959[3]; in 1960, CS was officially adopted by the United States Army for use in riot control.[4] The production of lachrymators at Building E5380 was finally halted in 1964.

Based on this information, Building E5380 is eligible for listing on the National Register of Historic Places under Criterion A because of its direct association with chemical production during World War II and a portion of the Vietnam Conflict. This facility was directly involved with the primary mission of the United States Army Chemical Warfare Laboratories and its command group, the Army Chemical Center, presently the Research, Development and Engineering Command. It is also eligible for listing under Criterion C for its illustration as an industrial production facility.

'In 1923, the United States Government financed the development of chemical agents at Edgewood Arsenal. A great deal of time and expense went into the research and development of non-lethal irritants that could be successfully used in riot control and law enforcement.'[5] The first production of CN outside the laboratory at APG, then Edgewood Arsenal, was during 1921 and 1922; pilot scale manufacturing operations were successfully conducted in Building 605, CN Plant #1, which was then later expanded into a production plant.[6]

'A second CN plant, known as CN Plant #2 (Building E5380), was constructed in 1941 at a cost of $296,000 with an additional $119,000 spent for installed equipment. CN Plant #2 began production operations in 1941 and continued production until February 1943. There were any number of changes that were made to the equipment before and after operations had began; these were mainly due to equipment difficulties.'[7]

During the following year, the building underwent minimal equipment changes so that CNB and CNS could also be produced; CNB and CNS were produced from 1944 to 1945.[8] The building was placed in standby mode and then leased for a short period around 1950 to the Advance Solvents and Chemical Corporation.[9]

'From July to December, 1950, the Standby Maintenance Branch overhauled and processed for standby all equipment to Building E5380, including: scrubbing towers, water recirculating and cooling system, various storage tanks, all electrical equipment and light service, and all operating instruments and scales. Maintenance also included painting the interior of the building, the ventilating duct, pipe lines, pipe stacks, storage tanks and all other equipment to the building. At the time this maintenance overhaul took place, the catwalks were wood and were replaced as a part of this scheduled maintenance.'[10]

'From January to June, 1951, the Standby Maintenance Branch installed and modified the entire steam heating system, including: heating coils, pipe lines, and regulators. The Standby Maintenance Branch also replaced all deteriorated stair grating to three the outside stairs and catwalks and painted them for proper standby. They also cleaned and processed for standby the interior of six chemical storage tanks. Three Stokes vacuum pumps, four vacuum dryers, and the hot water circulating system to the dryers were taken off of standby and placed in operation. All broken window glass was removed and replaced and metal sashes and doors were sealed and painted. All broken transite siding, interior and exterior, was replaced and all leaks to the roof of Building E5380 were repaired.'[11]

For many years, CN was the most widely used lachrymator by civil and military authorities; however, dissatisfaction with its potency and chemical instability led military scientists to search for an alternative agent.[12] 'In early 1959, a requirement had developed for the production for approximately 20,000 to 25,000 pounds of a 'harassing-type chemical agent' for use in the control of 'large groups of unfriendly people'. A program was initiated to activate a standby chemical plant, procure materials, recruit personnel, and determine an initial set of operating conditions for the plant – manufacture of an agent in the quantities required had never been attempted. A survey of facilities was made and, in 1959, Building was taken off of standby and presented for CS agent production. This selection was based on a number of factors: the facility was in standby status; the facility was formerly used for the production CN; and probably most important of all, the manufacturing equipment needed for batch production was already located in Building E5380.'[13]

'Malononitrile, necessary for the manufacture of CS, was to be obtained from three private companies: Winthrop Laboratories, Kay Fries, and the Fisher Chemical Company. Options to purchase additional quantities of malononitrile from each of these companies were also obtained.'[14]

'With just about every detail planned out to ensure the successful production of CS, the Army Chemical Center envisioned only one bottleneck in the entire process – the delivery of the agent. The Army Chemical Center indicated that the use of government vehicles may be necessary to transport the needed materials to meet the production schedule. The Army Chemical Center realized the increased production capacity and transfer of necessary personnel to assist in operations would only be of value in meeting the timeline set forth if the materials could be delivered on time.'[15]

Plans originally called for a maximum output of 1,000 pounds per one 24-hour day; output was actually increased to 2,500 pounds per one 24-hour day.[16] Actual production of the agent began on March 25, 1959 and ended on April 23, 1959 with a total of 22,695 pounds of agent produced.[17]

'In 1964, the building was leased to Humphrey Chemical Company, Inc for the production of fire retardants; as a result, a great deal of production equipment was removed. Humphrey continued to use the building for the manufacture of fire retardants until November 30, 1988.'[18] In December 1988, it was speculated that a leak in the sewer line for Building E5380 existed; it is noted in a disposition form that the sewer lines had not been repaired since 1942.[19] A pump to aid the sewer system for the building was installed in May 1990.[20] After such time, the building was abandoned and, at present, still remains vacant.

9. Major Bibliographical References

Inventory No. HA-1994

SEE CONTINUATION SHEET

10. Geographical Data

Acreage of surveyed property	0.13 acres		
Acreage of historical setting	N/A		
Quadrangle name	Edgewood	Quadrangle scale:	1:24,000

Verbal boundary description and justification

SEE ATTACHED MAP – please note: the boundary for Building E5380 is the footprint of the building only.

Building E5380 is situated off of Williams Road, approximately one hundred-fifty feet from the intersection of Williams Road and Hanlon Road. Building E5380 is bounded on the north by a parking apron, on the east by Building E5375, on the south-east by Building E5374, and on the south by an open field. Williams Road, which runs approximately in a north/south direction, provides the boundary on the west side of Building E5380.

11. Form Prepared by

name/title	Tracy Dunne		
organization	Directorate of Safety, Health and Environment	date	24 September 2004
street & number	Building 5650	telephone	410-278-2479
city or town	Aberdeen Proving Ground	state	Maryland

The Maryland Inventory of Historic Properties was officially created by an Act of the Maryland Legislature to be found in the Annotated Code of Maryland, Article 41, Section 181 KA, 1974 supplement.

The survey and inventory are being prepared for information and record purposes only and do not constitute any infringement of individual property rights.

return to: Maryland Historical Trust
DHCD/DHCP
100 Community Place
Crownsville, MD 21032-2023
410-514-7600

Maryland Historical Trust
Maryland Inventory of
Historic Properties Form

Inventory No. HA-1994

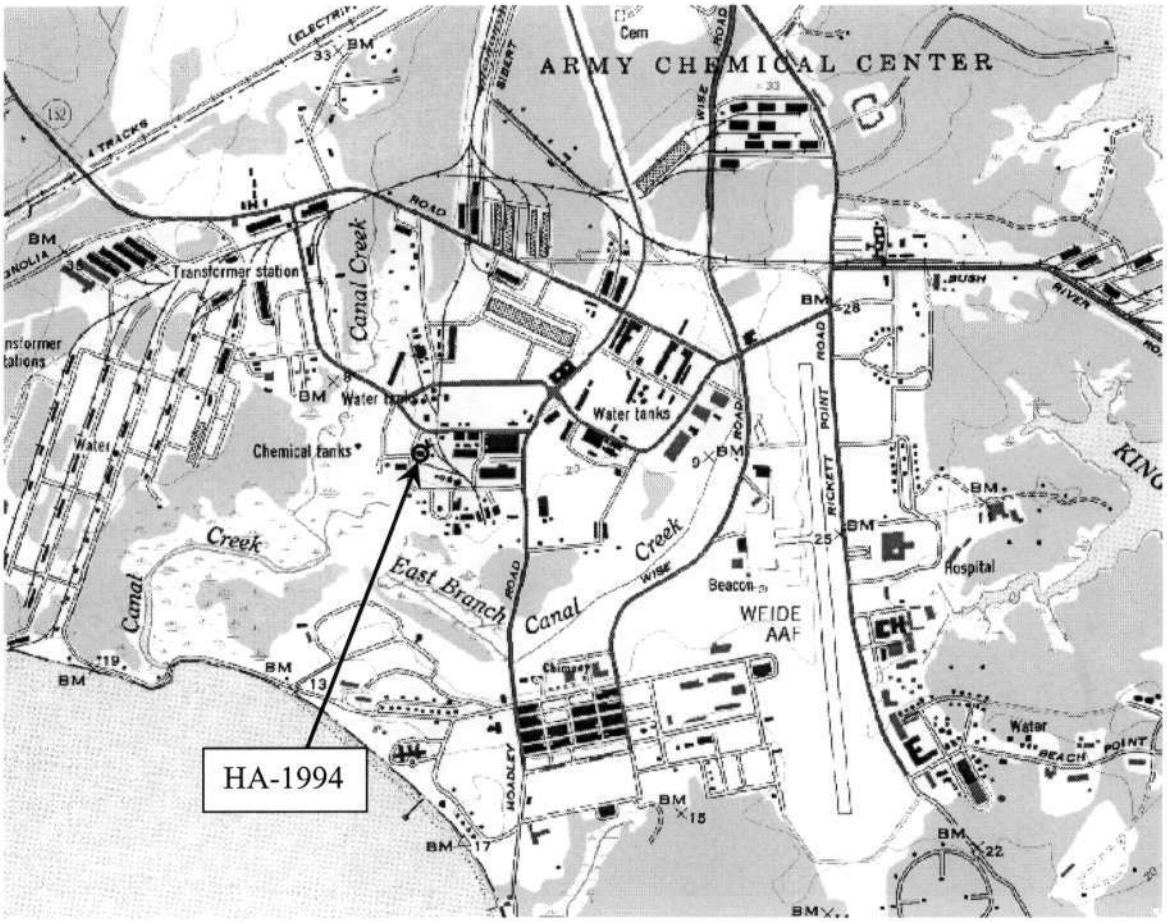
Name: Building E5380 (preferred)
Continuation Sheet

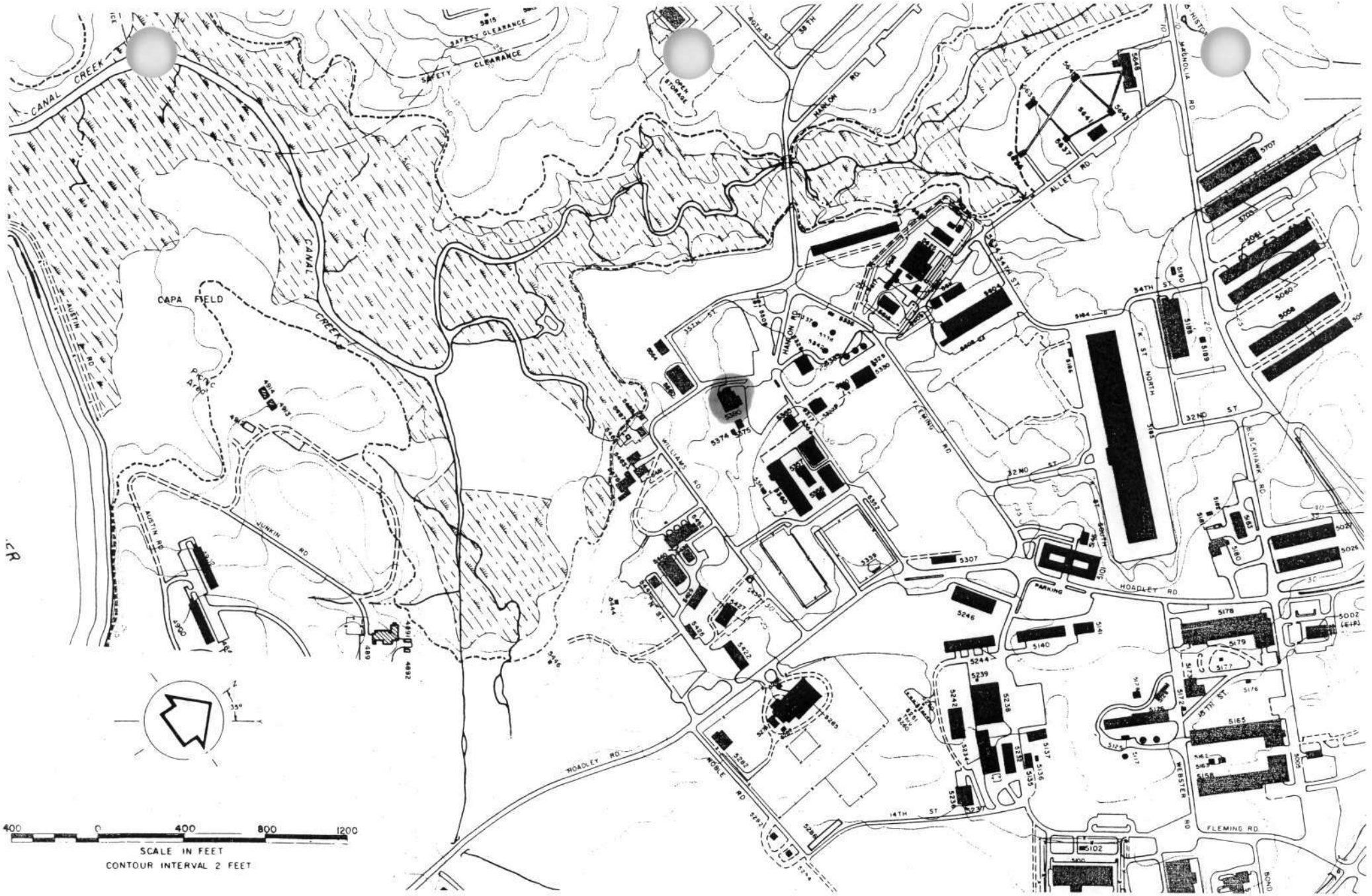
Number 9 Page 1

NOTES

1. *History of Edgewood Arsenal Production Division*, Edgewood Arsenal, 1943, 4.
2. Katherine Grandine, HABS/HAER Inventory for Building #E5380, National Park Service, August 1982.
3. Gary Nemeth, *RCRA Facility Assessment, Edgewood Area, Aberdeen Proving Ground, MD*, United States Army Environmental Hygiene Agency, No. 39-26-0490-90, 1989, 45-46.
4. "Tear Gases: CS – Orthochlorobenzylidenemalononitrile CIC6H4CHCCN(CN)2" *Zarc International, Inc.* 11 August 2004 http://www.zarc.com/english/tear_gases/csmain.html.
5. "Tear Gases: CN – Chloroacetophenone C6H5COCH2CI" *Zarc International, Inc.* 11 August 2004 http://www.zarc.com/english/tear_gases//cn-main.html
6. Nemeth, 43.
7. *History of Edgewood Arsenal Production Division*, Edgewood Arsenal, 1943, 4.
8. *List of Buildings, Manufacturing and Filling Branch, From 1 January 1940 to 31 October 1945*, Edgewood Arsenal, n.d.
9. *Buildings- ACC,* Edgewood Arsenal, n.d.
10. *History Record – 1 July – 31 Dec 50 Standby Maintenance Branch*, Edgewood Arsenal, n.d., 2.
11. *History Record – 1 January – 30 June 1951 Standby Maintenance Branch*, Edgewood Arsenal, n.d., 2-3.
12. "Tear Gases: CS – Orthochlorobenzylidenemalononitrile CIC6H4CHCCN(CN)2" *Zarc International, Inc.* 11 August 2004 http://www.zarc.com/english/tear_gases/csmain.html.
13. Paul M. Cavey and Bruce A. Hildebrand, *Production of Agent CS (U)*, US Army Chemical Warfare Laboratories Technical Memorandum 31-84, Army Chemical Center, Maryland, 1959, 1-2.
14. *Status Report No. 1 on Agent CS*, 1959.
15. *Status Report No. 1 on Agent CS*, 1959.
16. *Status Report No. 1 on Agent CS*, 1959.
17. Cavey and Hildebrand, 1.
18. Robert Eldringhoff, Memorandum for Commander: Justification of Disposal of Buildings 99, E5380, and E5440, 1 June 1998.
19. MAJ Eric G. Gillespie, letter to STEAP-SV-PP Attention: Ms. Curry, 16 December 1988.
20. APG Real Property Records, Real Estate Offices, Aberdeen Proving Ground.

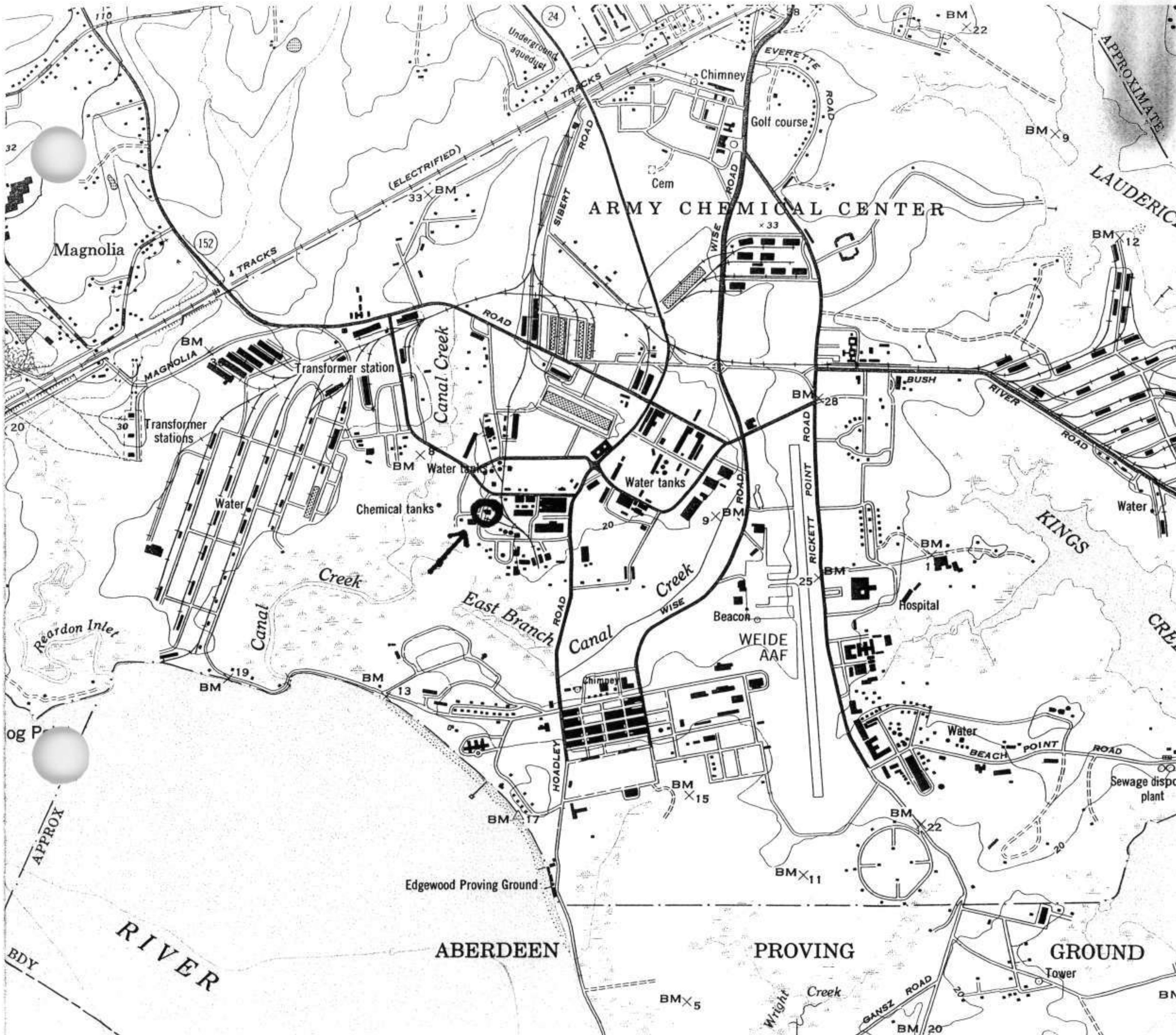
HA-1994
Building E5380
Williams Rd.
Aberdeen Proving Ground
Edgewood vicinity
Edgewood Quad.
Harford County





MIHP# HA-1994
Building E5380 (preferred)

Continuation Sheet
10.1



386 (GUNPOWDER NECK) 5762 IV SE 388 17'30" 389 390

SCALE 1:24 000

1 ½ 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

Prim hard

Seco hard

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
DEPTH CURVES IN FEET DATUM IS MEAN LOW WATER
THE RELATIONSHIP BETWEEN THE TWO DATUMS IS VARIABLE
SHORELINE SHOWN REPRESENTS THE APPROXIMATE LINE OF MEAN HIGH WATER
THE AVERAGE RANGE OF TIDE IS APPROXIMATELY 1.5 FEET

QUADRANGLE LOCATION

FOR SALE BY U. S. GEOLOGICAL SURVEY, RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

MIHP# HA-1994
Building E5380
Aberdeen Proving Ground, Harford
Edgewood

HA-1994

E5280

HARFORD, MD.

T. DUNNE

6/2000

MD SHPO

N. ELEVATION

1/7

HA-1994

E5380

HARFORD, MD.

T. DUNNE

6/2000

MD SHPO

E ELEVATION

2/7

HA-1994

E5380

HARFORD, MD.

T. DUNNE

6/2000

MD SHPO

SE ELEVATION, CAMERA FACING NW

3/7

HA-1994

E5380

HARFORD, MD.

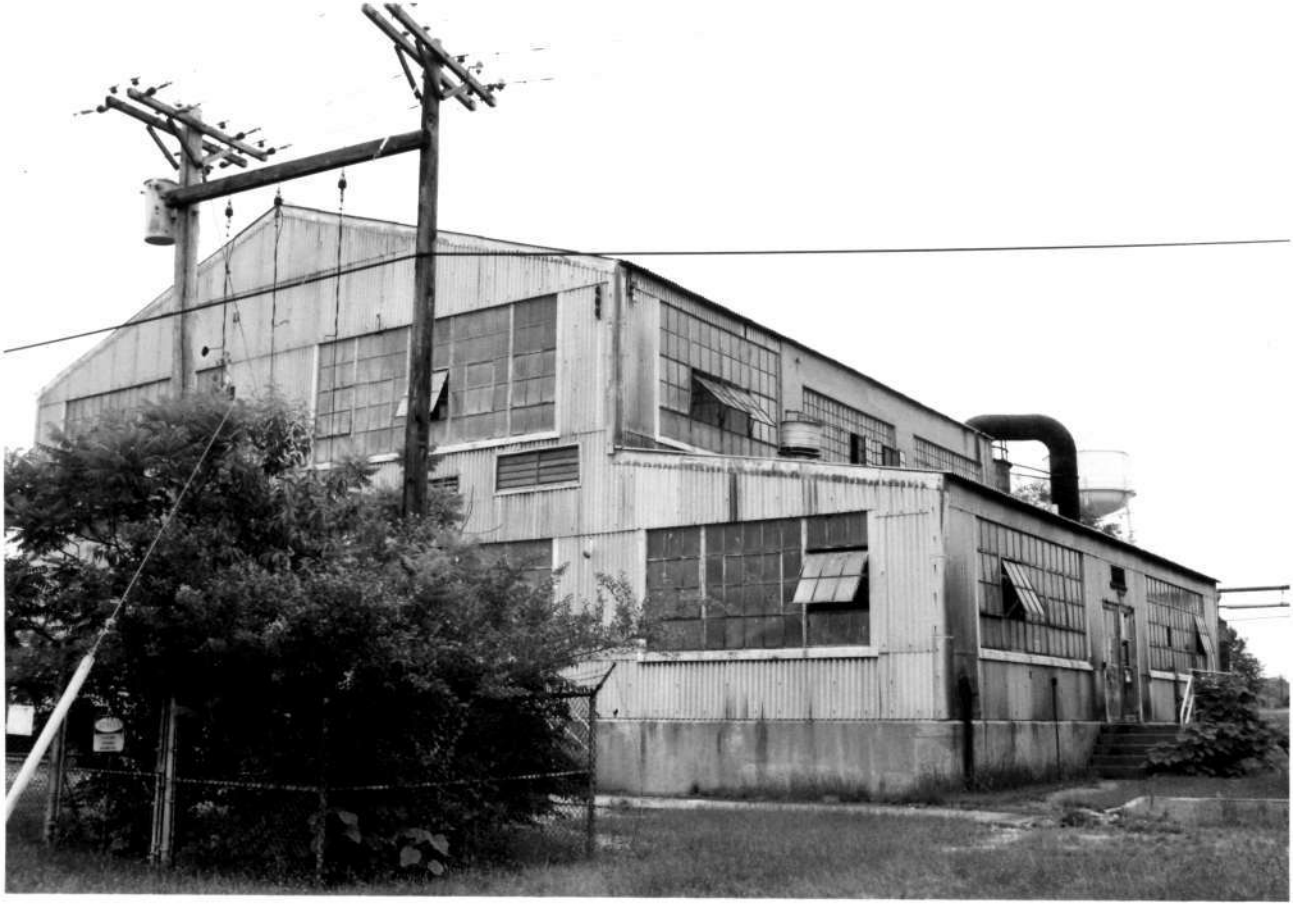
T. DUNNE

6/2000

MD SHPO

S ELEVATION, CAMERA FACING N/NW

4/7



HA - 1994

E5380

HARFORD, MD.

T. DUNNE

6/2000

MD SHPO

SW ELEVATION, CAMERA FACING E/NE

5/7

HA-1994

E5380

HARFORD, MD.

T. DUNNE

6/2000

MD SHPO

W ELEVATION

6/7

HA-1994

E5380

HARFORD, MD.

T. DUNNE

6/2000

MD. SHPO

NW ELEVATION, CAMERA FACING SE

7/7